

REMARKS

Claims 1-4, 6-9, 11-29, 31-38, and 40-48 are pending in the application. Claims 1, 26, and 34 have been amended. Claims 5 and 30 have been canceled. No new matter has been added. Reconsideration of the claims is respectfully requested.

Provisional Double Patenting Rejections

Claims 1-9, 10-38 and 40-48 were provisionally rejected under the judicially created doctrine of obvious-type double patenting as being unpatentable over claims of copending applications 10/015,151 and 10/014,277.

Applicant notes that these double patenting rejections are provisional. With regard to the rejection based on application 10/015,151, this rejection will not be addressed until either it, or the present application, is issued as a patent. At that time, Applicant will be able to properly address the provisional double patenting rejection according to MPEP § 804.

Regarding the rejection based on 10/014,277, which has issued as U.S. Patent No. 6,859,469, Applicant disagrees that there is an issue of obviousness-type double patenting. It is stated in the Office Action that although the conflicting claims are not identical, they are not patentably distinct from each other because the devices claimed in the copending application inherently practice the methods claimed. Applicant respectfully contends that there is no "inherent" practice of the claims of US 4,859,469 in the claims of the present application, as currently amended, and that the claims in this application are patentably distinct from those of the '469 patent.

Claims 1, 15, 19 and 30 of the '469 patent require, *inter alia*, that the fringe-producing optical element comprise a diffractive etalon or a non-parallel etalon comprising one of a non-planar etalon or a Fresnel etalon. There is nothing inherent in any of the independent claims of the present application that one must use the types of etalons listed in the independent claims of the '469 patent. These claims are patentably distinct over the claims of the present case.

Furthermore, claims 1, 26 and 34 of the present invention, as currently amended, each include a detector unit that includes at least three detector elements disposed to detect respective portions of the pattern period and also includes additional detector elements disposed to detect similarly phased portions of the interference pattern as associated detector elements of the at least three detector elements. Signals from the at least three detector elements are summed together

with signals from their respective associated detector elements to produce detection signals associated with each of the at least three detector elements. Applicant respectfully asserts that practice of claim 1 in the '469 patent does not require the detector unit as set forth in claims 1, 26 and 34 of the present application and that these claims are patentably distinct over the claims of the '469 patent.

Claim 47 of the present invention is directed to a laser device that has a laser, an optical element generating an interference pattern, a detection unit having detector elements that detect portions of the interference pattern and a control unit that generates a signal indicative of laser power from the detection signals received from the detector elements. Applicant respectfully asserts that there is nothing in this claim that inherently makes practice of this claim also practice claim 1 of the '469 patent. For example, this claim is not limited to use of the particular types of etalons listed in claim 1 of the '469 patent. Similarly, there is nothing in claim 1 of the '469 patent that requires practice of that claim to generate a power signal indicative of laser power. That claim is directed solely to the stabilization of the laser's wavelength. Thus, claim 47 is patentably distinct over the claims of the '469 patent.

Applicant respectfully requests that the obviousness-type double-patenting rejection based on the '469 patent be withdrawn, since the claims in this case are patentably distinct from the '469 patent.

Rejections under 35 U.S.C. § 102

Claims 1-9, 11, 16-23, 34, 37-42 47 and 48 are rejected under 35 U.S.C. §102 (b) as being anticipated by Snyder (U.S. Patent 4,173,442).

Snyder teaches an apparatus and method for determining the wavelength of laser light. The apparatus includes a Fizeau-type interferometer (16) which generates an interference fringe pattern when illuminated by the laser (2). The fringe pattern is detected by a diode array (40) and processed in a signal processing circuit (44).

To anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 9 USPQ2d

1913, 1920 (Fed. Cir. 1989). Therefore, all claim elements, and their limitations, must be found in the prior art reference to maintain a rejection based on 35 U.S.C. §102. Applicants respectfully submit that Chang does not teach every element of independent claim 1, and therefore fails to anticipate claim 1.

Independent Claim 1

The invention of independent claim 1 is directed to a device for determining frequency of a laser producing an output light beam having a laser frequency. The device includes, *inter alia*, a detector unit having at least three detector elements disposed to detect respective portions of the pattern period and having including additional detector elements disposed to detect similarly phased portions of the interference pattern as associated detector elements of the at least three detector elements. Signals from the at least three detector elements are summed together with signals from their respective associated detector elements to produce detection signals associated with each of the at least three detector elements

In particular, Snyder fails to teach that the photodetector array has detector elements detecting different portions of the interference pattern, has associated detector elements that detect the same phase portions of the interference pattern as the detector elements and where the signals from detectors detecting the same phase of the phase pattern are summed together.

Instead, Snyder only teaches the use of a photodiode array detector, having multiple detector elements, in which the signal from each photodiode element is processed, digitized and then used to determine the wavelength of the light. Snyder does not teach that the signals from detector elements that detect the same phase of the interference pattern are summed together.

Thus, Snyder fails to teach all the elements of claim 1, and claim is allowable thereover.

Independent Claim 34

Claim 34 comprises, *inter alia*, a control unit like that in claim 1. Accordingly, claim 34 is also not anticipated by Chang.

Independent Claim 47

Independent claim 47 is directed to a laser device that comprises a laser generating an output light beam and an optical element that generates an interference pattern from light derived

from the output light beam, the interference pattern defining a pattern period. A detector unit is disposed to detect the interference pattern and includes at least three detector elements disposed to detect respective portions of the interference pattern period. A control unit is coupled to receive detection signals from the detector unit related to the respective portions of the interference pattern period. The control unit generates a signal indicative of laser power from the detection signals.

There is no mention in Snyder of detecting at least three portions of an interference pattern and then generating a signal indicative of laser power in response. Snyder only teaches using the signals from the detector array for determining the wavelength of the laser light, not the power of the laser light. Accordingly, Snyder fails to teach that the control unit generates a signal indicative of the laser power based on the detected portions of the interference pattern.

Thus, Snyder fails to teach all the elements of claim 47, and so claim 47 is not anticipated by Snyder.

Dependent Claims

Dependent claims 2-9, 11, 16-23, 37-42 and 48, which are dependent from independent claims 1, 34 and 47, were also rejected under 35 U.S.C. §102(b) as being anticipated by Snyder. While Applicants do not acquiesce with the particular rejections to these dependent claims, it is believed that these rejections are moot in view of the remarks made above in connection with independent claims 1, 34 and 47. These dependent claims include all of the limitations of the base claim and any intervening claims, and recite additional features which further distinguish these claims from the cited references. Therefore, dependent claims 2-9, 11, 16-23, 37-42 and 48 are also in condition for allowance.

Regarding claims 20, 21 and 46, Snyder fails to teach that the control unit generates a signal indicative of laser power from the detection signals generated by the same detector elements that detect the interference pattern, i.e. fails to teach that the same detector signals that are used to control frequency are also used to detect the laser power. Furthermore, Snyder fails to teach controlling the laser power based on the detection signals that are used to control the laser frequency.

Rejections under 35 U.S.C. § 103

Dependent Claim 12

Dependent claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Snyder in view of Russell (U.S. Patent No. 6,151,114). It is stated in the Office Action that Snyder, fails to show the use of a non-parallel having at least one curved surface, and that Russell teaches such an etalon. It is also stated that it would have been obvious to one of ordinary skill in the art to use Russell's etalon in order to differentiate the effects of the arrival angle of the beam from the wavelength of the beam.

Russell teaches the use of a dome etalon (70) which presents a range of angles to the incident laser energy at the same time (col. 7, lines 55-59).

Three criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference, or combination of references, must teach or suggest all the claim limitations. MPEP § 2142. Applicant respectfully traverses the rejections since the prior art fails to disclose all the claim limitations, and there would be no motivation to combine the references in the manner proposed.

Applicants do not admit that Russell's domed etalon is a non-parallel etalon: the two surfaces of the etalon appear to be concentric arcs, and so the two surfaces can thus be considered to be parallel to each other, since the two surfaces never meet each other.

More importantly, however, the motivation to combine Russell with Snyder is lacking. Russell describes a coherent laser warning system for detecting the presence of incident radiation which is substantially coherent, such as the light from a laser (col. 3, lines 39-42), by detecting the presence of fringes. Furthermore, the position of the center of the fringe pattern provides information as to the direction of the incident light beam.

The invention of claim 12, on the other hand, is not to detect whether or not interference fringes are present, but to detect different portions of the interference fringe pattern and to control the frequency of the laser based on the resulting detection signals. Accordingly, there is no need to make a determination as to whether the light is coherent or not: its coherence is already assumed in the present technique, since the light is output from a laser. Furthermore, the purported motivation for combining Russell with Snyder is to differentiate the effects of the

arrival angle of the beam. There is no issue, however, with the present invention as to the arrival angle of the beam. In fact, if the direction of the laser beam varied in the manner alleged by the Examiner, the resulting fringe pattern would change with direction, even if the frequency of the laser itself remained the same. Thus, if the laser's angle of incidence on the fringe-producing element changed from time to time, it would not be possible to stabilize the frequency of the laser. Thus, one of ordinary skill would not be motivated in the manner set forth in the Office Action, since there would be no expectation that the laser's frequency would be controllable.

Lastly, Russell fails to remedy the deficiencies of Snyder discussed above with regard to claim 1.

Accordingly, the proposed combination of references fails to teach or suggest all the elements of the invention of claim 12, and there would be no motivation to combine the references in the manner proposed. Claim 12 would, therefore, be patentable over the proposed combination of Snyder and Russell.

Claims 22-25 and 43-46

Claims 22-25 and 43-46 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Snyder and DeAndrea et al. (U.S. Patent No. 5,515,468) (DeAndrea). It is stated in the Office Action that Snyder does not expressly show the elements of the laser, but that DeAndrea shows the elements of the laser including the power source and the collimating and focusing elements. It is alleged in the Office Action that one of ordinary skill in the art would have a stable laser source.

DeAndrea teaches different approaches to packaging semiconductor lasers. DeAndrea does not, however, remedy the deficiencies of Snyder discussed above with regard to claims 1 and 34. These claims are, therefore, patentable over the proposed combination of Snyder and DeAndrea.

Claims 26-33

Claims 26-33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Snyder in view of Sharma et al. (U.S. Patent No. 6,331,906) (Sharma). It is stated in the Office Action that Snyder does not show the elements of the communications systems, but that Sharma does show the claimed elements and that it would have been obvious to one of ordinary skill in the art to

combine the teachings of Snyder with Sharma in order to have a communications system with a stable light source.

The invention of claim 26 is directed to an optical communications system which includes, *inter alia*, a detector unit like that of claim 1.

Snyder has been shown to be deficient and does not anticipate claim 1. Sharma fails to remedy the deficiencies of Snyder, and so claim 26 is patentable over the proposed combination of Snyder and Sharma.

Claims 27-33, which depend from claim 26, further distinguish the invention. Since these claims depend from claim 26, which is allowable over the proposed combination of references, these claims are also allowable.

Furthermore, neither of the proposed references teaches or suggests the particular relationship between the separation of the detectors and the interference fringe spacing, or the additional detectors detecting the same phase of the interference pattern, as set forth in claims 27-30.

Conclusions

In view of the amendments and reasons provided above, it is believed that all pending claims are in condition for allowance. Applicant respectfully requests favorable reconsideration and early allowance of all pending claims.

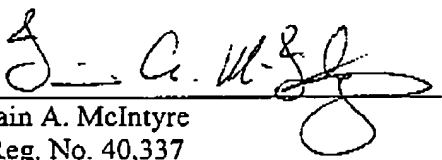
If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Applicant's attorney of record, Iain A. McIntyre at 612-436 9610.

Respectfully submitted,

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